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HYDROCELE MULIEBRIS, WITH THE REPORT OF A CASE.

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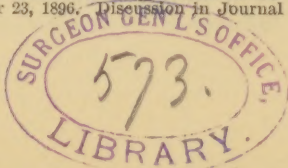
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CYSTS of the canal of Nück are not frequently met with, and the report of a case operated on by the writer a short time since may not be without interest, followed by a few remarks on the pathology of the disease.

The patient, Mrs. O. H., age sixty-three, was kindly referred to me by Dr. L. in April, 1896. The patient stated that she had always been in very good health, with the exception that she was rather of a nervous temperament. The menses appeared for the first time at the age of fourteen and one-half years, and were always regular up to the time of the menopause, which occurred at the age of fifty-two. They were not attended by any pain, and appeared to have been in every way normal. The patient had had three children at term and two miscarriages. Fifteen years previously the patient had first noticed a small lump in the right groin which was about the size of a cherry. The only symptom to which this small tumor gave rise was a dragging pain in the groin when the patient had walked a great deal and was tired. About two years previously the patient had slipped on an icy sidewalk and fell, but this fall only produced slight nausea, which was due to a pain which was started up in the region of the tumor. After this accident the

¹ Read before the Suffolk District Medical Society, Section for Obstetrics and Gynecology, December 23, 1896. Discussion in Journal of March 18, 1897, p. 264.



patient noticed that the tumor had increased in size.

She consulted a surgeon, who informed her that she had a hernia, and ordered a truss; and, according to the patient's statement, before the latter was applied, the so-called hernia was reduced. The wearing of the truss irritated the skin over the tumor to a certain extent, and obliged the patient to occasionally leave the support off; and two weeks previously to seeing the writer, after she had removed her truss she noticed that the tumor had increased considerably in size and was painful to the touch. A physician was sent for, who found the tumor irreducible, and sent for another doctor, who gave ether; and, according to the statements of this gentleman, they reduced the bunch and applied the truss. But finding that the seat of the tumor was a source of great pain to her, the patient consulted Dr. L., who kindly gave the case over to me.

The patient was a well-nourished woman, intelligent and apparently in very good physical condition. Examination of the tumor showed a lump in the left groin, situated in just the position that would be occupied by an inguinal hernia and about the size of a large hen's egg. Standing up or lying down in no way changed the shape of the lump, and there was no impulsion when the patient coughed. Palpation showed an elastic tumor which could not be reduced into the abdomen. The Trendelenburg position did not facilitate reduction of the tumor. Percussion gave a dulness over the tumor. Skin moved freely over the growth.

From the history of the case and from the fact that the patient said that the tumor had been reduced on several occasions, I was inclined to admit the diagnosis of an inguinal hernia, which had probably become inflamed and was adherent to the inguinal ring, thus

preventing its entrance into the abdominal cavity ; but I had never felt such an elastic, tense tumor before in the region, and I doubted the correctness of my diagnosis.

The patient entered the Elliot Hospital, and the operation was performed the following morning. An incision through the skin was carried over the long axis of the tumor, the subcutaneous fat carefully incised, and the hernia sac was searched for, but none was to be discovered. With a Kocher's director the tumor was separated from the surrounding tissue, and suddenly an apparently cystic growth came up into the wound. Dr. Maurice H. Richardson, being at the hospital at that time, was good enough to see the case and confirm the diagnosis that I had already made, namely, a cyst of the canal of Nück.

The tumor was connected in the abdominal ring by a long pedicle. It was transparent, its surface lobulated and over which ran a certain number of small vessels. The tumor was perfectly transparent ; but in order to be sure of my diagnosis, a puncture was made ; about three ounces of a clear, straw-colored liquid escaped and the tumor collapsed. The cyst was then drawn up out of the incision as far as possible, traction being made on the pedicle, and a stout silk ligature tied around the base, after which the tumor was severed from its attachment by scissors.

The wound was sutured with silk and an occlusive dressing applied. The subsequent events were of the simplest. There was no elevation of the temperature ; the sutures were removed at the end of a week ; and the patient left the hospital ten days after the operation in excellent condition.

Dr. L. has had the goodness to inform me recently that the patient is in every respect in the best of health, and that there is no complication at the site of the incision.

For many years, and even now, a certain number of surgeons refuse to admit the existence of cysts of the canal of Nück; but having carefully gone over the literature of the subject, and from the case here reported, the writer has no hesitation in believing that this condition is an actuality. As we all know, the round ligament is covered during fetal life by a prolongation of the peritoneum, which forms a complete envelope around it. According to Sappey, the peritoneum in the fetus reaches as high as the end of each round ligament, and forms an intra-inguinal canal known by the name of the canal of Nück, who was the first to give a description of the anatomy of this peritoneal prolongation in the year 1692.

In order to thoroughly understand the development of this canal, it is only necessary to say that the peritoneum adheres in its entire length to the round ligament, and that in the beginning of intra-uterine life the internal orifice of the inguinal canal is situated behind the external orifice. The peritoneum comes up near the latter, but later on the internal orifice is directed outwards, and little by little, as it becomes farther and farther away from the external opening, the round ligament with its peritoneal covering is drawn along with the internal orifice as it recedes, and thus is formed the canal of Nück. From the fourth to the sixth month it is very marked, and measures about six millimetres in length. Its evolution is exactly the same in both sexes, because the gubernaculum testis, which in the male goes through the same orifices, in order to reach the scrotum, is also drawn upwards and outwards, as the distance between the external and internal orifices of the inguinal canal becomes greater. Consequently the inguinal canal is occupied by the peritoneum when the testis enters, and traverses the canal when no obstruction is present. The gland at this time is about equal in size to

the gubernaculum. In the female the canal surrounding the intra-inguinal portion of the round ligament no longer exists at birth, as it rapidly becomes atrophied. It often disappears at the eighth or even seventh month of intra-uterine life.

The question now arises, Can this peritoneal prolongation still be present after birth?

Duplay, in his thesis written in 1865, denies emphatically the existence of the canal of Nück, basing his assertion on personal researches carried out in 21 fetuses, who varied in age from four months to nine months, and in which he was unable to find this canal. However, Duplay's opinion has been since upheld by two of his pupils, Rabère in 1883 and Beurnier in 1885. The majority of anatomists are opposed to Duplay's opinion. Wharton has found a small canal, the size of a goose-quill, measuring about a centimetre and a half in length and limited to the lower part of the inguinal canal, in young female cadavers. Out of 200 female cadavers Wrisberg found the canal of Nück in 19 of the subjects. Camper examined 14 newly born female children, and in 11 he was not able to detect any trace of the canal, while in the remaining three it was present; twice it was found on the left and once on the right side. The same writer in another series of 20 subjects found this canal closed up in 15, traces of it in three on the right side, while in two it was patent on the left. Sacchi found the canal in one out of three female fetuses that he examined.

Tillaux says that the canal of Nück is a prolongation of the peritoneum accompanying the round ligament, similar to the peritoneo-vaginal canal, which results from the descent of the testis into the scrotum. It is most often obliterated, but its remains may persist, which later on can become filled with fluid and thus form a cyst, constituting a hydrocele muliebris;

and this is probably what happened in the writer's case, when we consider how late in life the tumor developed in his patient. Cruveilhier states in his work on anatomy that he had found this canal not infrequently in elderly women, and this statement is also upheld by the researches of Ramonede. The more recent anatomical researches of Richet, Féré, Senn, Virchow, Zuckerkandl and Hugo Sachs better demonstrate the possibility of the presence of the canal of Nück after birth. Out of 158 cadavers of subjects varying in age from birth up to three years, Féré found the peritoneal process accompanying the round ligament and perfectly patent on both sides in one, on the left in three, and on the right side only in one. The canal was incompletely obliterated on both sides in one subject; in nine the canal on the right, and in all on the left side were obliterated. Of these 17 subjects, eight were one month, two were over two months old, while the remaining seven had attained a certain age. Of 19 subjects varying in age from one to twelve months Zuckerkandl found the canal present on both sides in three.

Sachs examined 105 female infants, varying in age from birth up to one year, and found that 11 presented a canal of Nück on both sides; in 16 the canal was patent on the right and obliterated on the left side; while in nine, five were completely obliterated on the right and incompletely so on the left. In only one case did this writer find the canal perfectly permeable on the left. It may reasonably be concluded from what has been said that no doubt should any longer remain as to the possibility of the persistence of the canal of Nück in adult life; and thus having endeavored to prove this, we will now consider the pathology of the subject.

Serous cysts in the groin and labium of women were probably first mentioned by Ætius in the year

543 A. D., who gave the first description, after the writings of the midwife, Aspasia. Ambroise Paré reports that he operated on a hydrocele in a young girl of six years, in order to give issue to its contents. Désault reported in 1791 that he opened the tumor in a girl of twelve, giving issue to two or three ounces of serous fluid. The tumor had been present for some time; it was soft, transparent, the size of an egg, and situated on the round ligament. Many of the older writers — as Lallement, Palleta, Lecat, Scarpa and Sacchi and others — attributed these cysts to the persistence of the canal of Nück after birth. Bends also has given a very good explanation; and Schroeder gives an excellent description of the affection in von Ziemssen's Encyclopedia, and divides it into two varieties, namely, an extra- and an intra-peritoneal form. Schroeder, Weber and Koppe admit the possibility of these cysts occurring in the interior of the round ligament. The latter attributes this origin to the hematic cysts which are sometimes met with, and may be properly termed hematocele of the round ligament. Ancelon, Morpain and Brochon consider these serous cysts to be like those developed in the dartol infundibulum, which was first described by John Hunter, and lately more completely by Broca. The dartol infundibulum is similar to the sustaining apparatus of the penis and scrotum, being entirely composed of elastic tissue, and has no relation to the dartos of the male.

The following paragraph is taken from Richet's work on topographical anatomy, from the edition 1866:

"A great rôle has been given by some to this so-called dartol sac, considering it as the seat of hydrocele in the female; but it suffices, in order to reject this manner of thinking, to remark that, first, the dartos, which is not a sac, and still less a continuous membrane, is made up of elastic fibres, and can in no

manner secrete a serous liquid ; secondly, in the cavity covering these fibres only fat and the extremity of the round ligament are to be found ; thirdly, the remains of Rosenmüller's body described by Giraldès in the middle of the region of the epididymis, and which are recorded as the origin of encysted hydrocele of the cord, which did not exist here ; fourthly and lastly, no worthy pathological report has been given to uphold this opinion, which has not even an analogy, because, in the male, there is no such condition as hydrocele of the dartos."

Consequently it is impossible, as is stated by Vasseur, to attribute a hydrocele in a female to a dropsy of the dartol infundibulum, because this sac does not exist in a strict sense.

Richet gave three causes for hydrocele muliebris : first, hydrops of an old hernia sac ; secondly, cysts of the vulvo-vaginal gland ; thirdly, serous collections in the organs of the canal of Nück, or old sanguineous collections which had undergone a transformation.

The teachings of Velpeau can no longer be upheld, and the peculiar theory of Vidal (de Cassis) cannot be seriously considered. At the present it is probable that the majority of surgeons consider hydrocele muliebris as a serous fluid developing in the *débris* of the canal of Nück, and comparable to cysts of the cord in the male. Gaillard Thomas considers the affection as probably resulting from a hypersecretion of the serous membrane. If the abdominal opening of the canal remains patent, the fluid which collects may easily be forced upwards by pressure ; but if the orifice is closed, the liquid becomes encysted, as in the writer's case. Hennig, Hegar and Kaltenbach believe that cysts developing in the round ligament generally occur from some abnormal condition in the evolution of the canal of Nück, which is only obliterated at the internal opening of the inguinal canal. These

cysts, only typical as in the writer's case, are elongated tumors, usually about the size of an egg, filling the inguinal canal and sometimes extending into the labium majorum of the corresponding side. At the posterior aspect of the tumor a whitish-colored band, which is sometimes of a pale red hue, is found, which is the round ligament. If the peritoneal canal is obliterated at all points, the cyst will have an hour-glass shape. Pozzi, Auvard and Tillaux also believe that these cysts originate in the remains of the canal of Nück. In the writer's case and the one reported by Richelot, the absence of any history of hernia, the isolation of the sac at the top of the labium majorum, the vascular elements in the walls, the interior formation which is in every way similar to the vagino-peritoneal canal of the male, the extreme narrowness of the connecting canal in Richelot's patient and its entire absence in the writer's case, clearly demonstrate that these were liquid collections developed in a *débris* of the canal of Nück.

In 1890 Wechselmann wrote a very important and complete paper on cysts of the canal of Nück, in which he clearly demonstrates that a certain number of cysts developing in the inguinal region in the female, originate in the remains of Nück's canal at its terminal end, its communication with the peritoneum having become more or less obliterated. Recently very conclusive facts have been reported by Berger, Terrillon and others, regarding congenital inguinal hernia in women, coexisting with hydrocele of the canal of Nück. It is certain that the remains of the latter, with the upper portion remaining patent, may cause a congenital hernia in the female in every way like the congenital hernia met with in the male, when the vagino-inguinal canal remains open.

Wechselmann reports three cases of these cysts, which were complicated with hernia, while Berger,

Reclus, Routier, Tuffier and Terrillon reported similar cases at the Surgical Society of Paris; and recently Cachau reports two others.

To sum up, it may be said that the many researches that have been carried out amply demonstrate that cysts may form in the remains of canal of Nück, and that they may be complicated with congenital hernia when the upper portion of the canal is not obliterated, the latter having the same pathogenesis as the cyst and developed simultaneously along with it.

The symptoms of hydrocele in the female are often quite distinct, and sufficiently characteristic to allow the making a diagnosis in many cases. The physical signs of these cystic collections are as follows: They are generally oval tumors varying in size from a cherry to that of a large egg; but this shape is not always the same, for they may be cylindrical or more or less pyriform, while the surface may present lobes such as were found in the writer's case. They may be situated in the interior of the inguinal canal or at the *upper and external* aspect of the labium majorum. This latter site is important for the diagnosis, because mucous cysts of the vulvo-vaginal gland are always situated in the *lower part* of the labium; in a number of cases the cyst was found to extend to the upper part of the labium. The diameter of the tumor is usually greater in the direction of the axis of the inguinal canal. In looking over the literature the writer found that these cysts occur more frequently on the left side.

The skin covering the cyst is normal, and can be moved easily over its surface. A kind of pedicle may sometimes be felt by palpation, as in the case reported by Manley, and is directed downwards into the inguinal canal. The consistency of these collections is often soft, but when they are moderately distended fluctuation may be elicited. In the writer's case, how-

ever, the tumor was quite hard and elastic to the feel. Percussion will give complete dullness.

When the surgeon is in the presence of a true cyst of the canal of Nück, the tumor will be absolutely irreducible because the fluid is encysted. Sometimes, however, the tumor may be reduced *en masse* into the abdominal cavity, but it will immediately return to its former position as soon as pressure is removed. On the contrary, if the tumor is a congenital hydrocele, that is to say, a cyst developed in an unobliterated canal of Nück, it can be reduced by pressure or by simple dorsal decubitus. It is in these cases that the diagnosis is sometimes very difficult, and a very careful examination is necessary in order to decide whether we are in presence of a hernia or a simple cyst. However, the percussion, dullness, the ease of reduction (which is progressive and causes no gurgling sound when the sac slips into the abdominal cavity), the transparency of the tumor (which in some cases is quite distinct), are sufficiently good signs of hydrocele, if they are to be found.

There is no impulsion given to the tumor when the patient coughs, and in certain cases the cyst is more liable to retract. The contents of these cysts are usually clear and limpid, but may, however, present the characteristics of a hydro-hematocele, or even a true hematocele.

Generally speaking, the functional signs are of little importance, as the patients rarely suffer from their tumor, even when it has attained a considerable size. The evolution is usually very slow, and the surgeon will rarely see the patient when the tumor is still small. It is only after it has reached a certain size, producing considerable inconvenience, that the patient will ask for an operation.

A condition of affairs that has been observed in several cases is acute inflammation of the cyst, which

may produce accidents similar to those occurring in strangulated hernia, and some surgeons have operated on such cases supposing they were in presence of a hernia, and have been much astonished when they cut down and found a simple cyst.²

The diagnosis of this affection would appear to be quite easy; but in reality it is not so, and many mistakes have been mentioned by various authors. The principal affections which are to be taken into consideration are cysts of the labium, hernia, hernia of the ovary, varicose veins of the round ligament, lipoma of the labium, dermoid cysts of the skin, fibroma or fibromyoma of the round ligament, as well as sarcoma, although the latter affection is extremely infrequent in this region.

Regarding the treatment, the writer has little to say. It naturally consists in an extirpation of the cyst and ligation of its pedicle. This, of course, applies to the true form of cysts of the canal of Nück, in which no communication exists between them and the peritoneal cavity.

Puncture, and removing the fluid, followed by an irritating injection, would naturally be bad practice, and is only mentioned here to be condemned.

² Mr. Wm. Thomson (Dublin Journal of Medical Science, December, 1896) relates a case of supposed strangulated labial hernia. The patient was admitted, suffering from symptoms which suddenly came on. There was a lump in the groin which had suddenly become larger, painful and tense; then followed vomiting and prostration. The tumor extended from the external abdominal ring into the left labium. Incision showed that the tumor was a cyst of the canal of Nück.

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